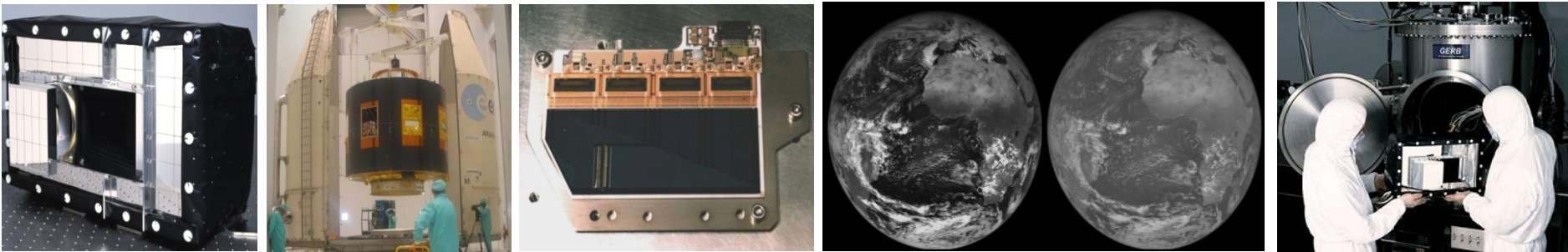


GERB3 commissioning calibration comparison



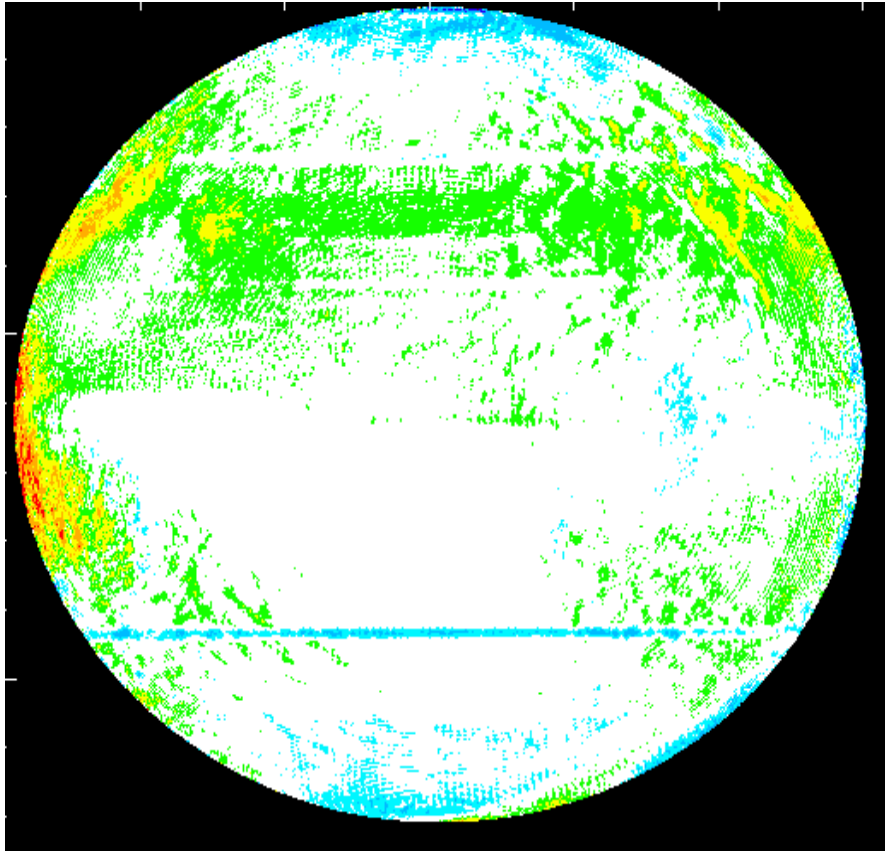
Jacqui Russell, (GERB project scientist) Imperial College

GERB 3 initial validation Nov-Dec 2012

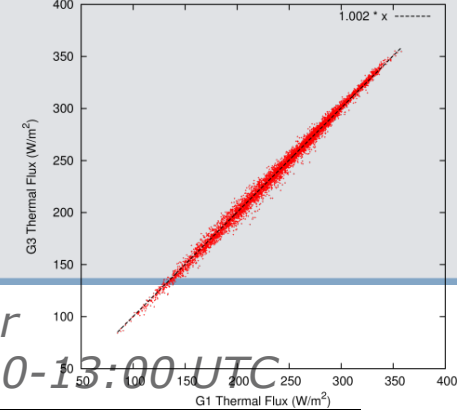
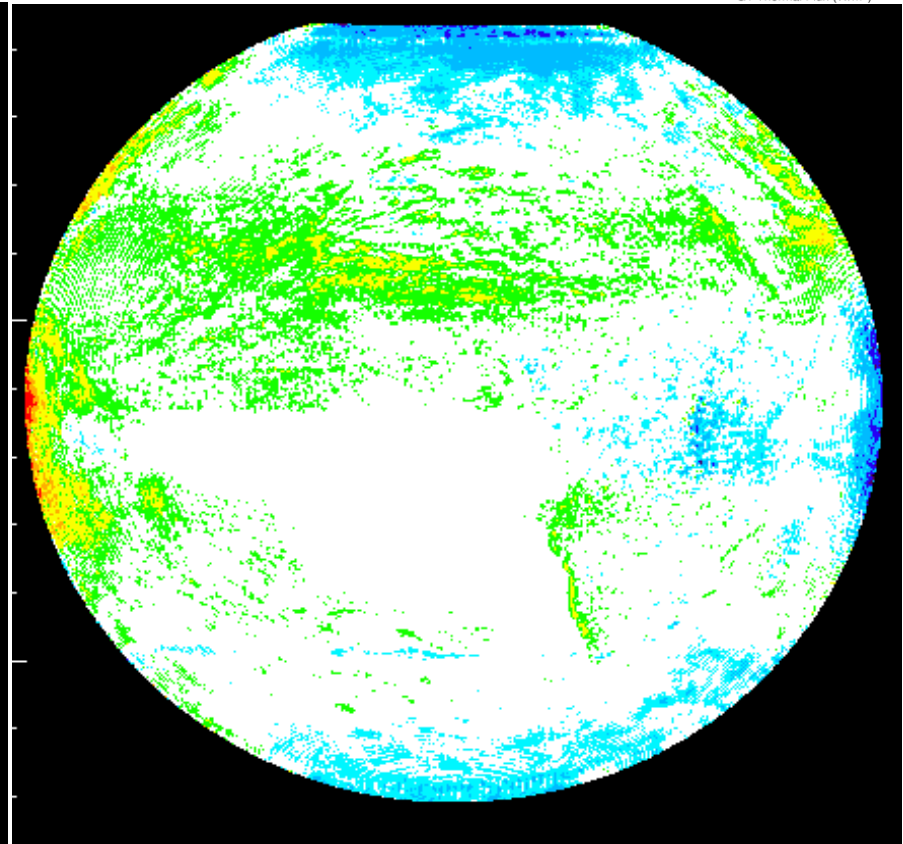
- Initial inter-comparison between GERB-1 and GERB-3 fluxes during November and December joint operation was carried out.
- The SW radiance from each instrument during this period has also been compared to CERES Ed3 products.
- After restart differences in the calibration between the two sides of the GERB 3 mirror apparent that require re-assessment and calibration adjustment and processing updates to address.

November 2012 GERB 3/GERB 1 LW flux comparison

Ratio of average fluxes for
November 2nd – 21st 00:00-02:00 UTC



Ratio of average fluxes for
November 2nd – 21st 11:00-13:00 UTC

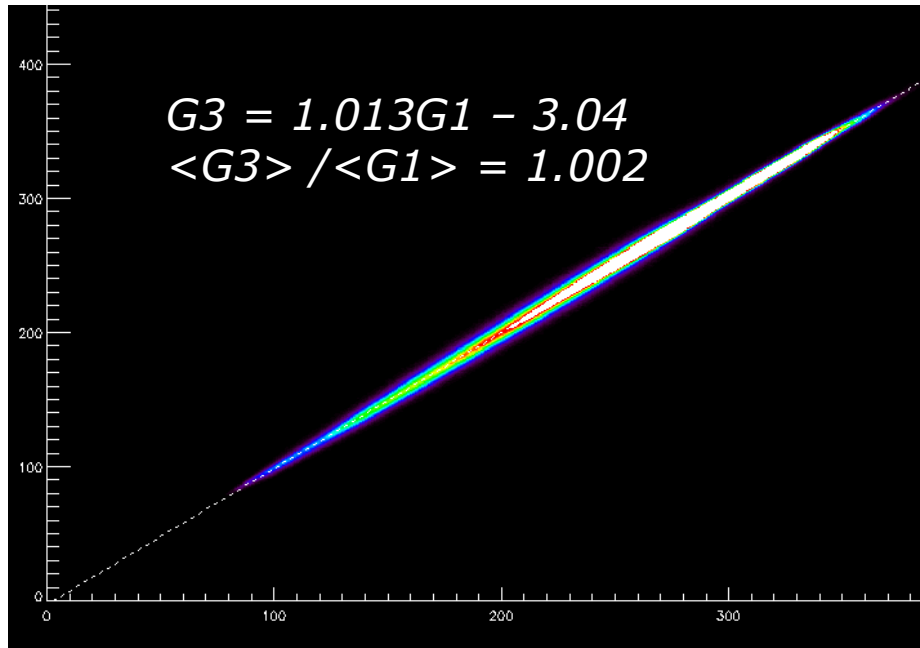


0.96 0.97 0.98 0.99 0.995 1.005 1.01 1.02 1.03

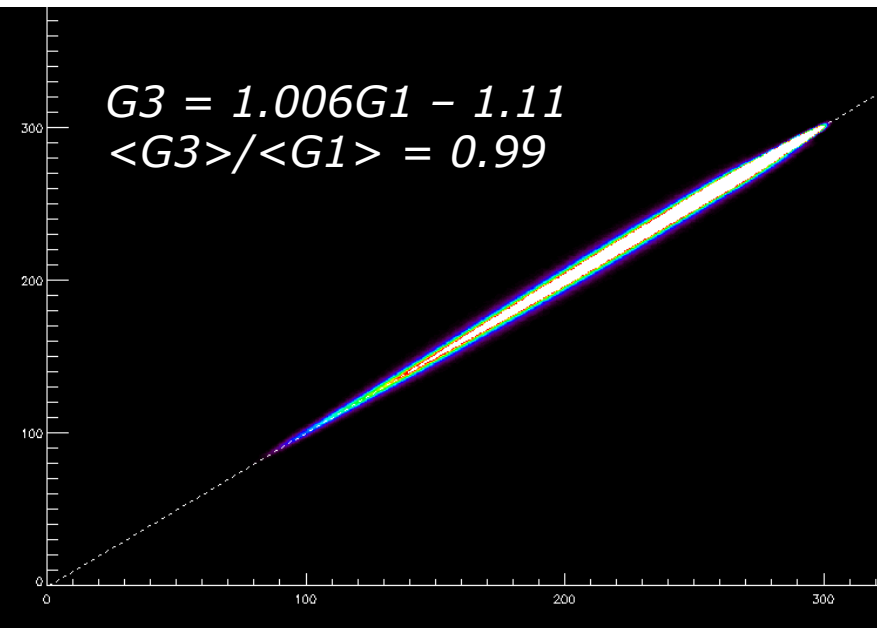
$\langle G3 \rangle / \langle G1 \rangle$ LW flux

GERB 3 GERB 1 LW flux regression day and night November 2012

11:00 – 13:00 UTC central region

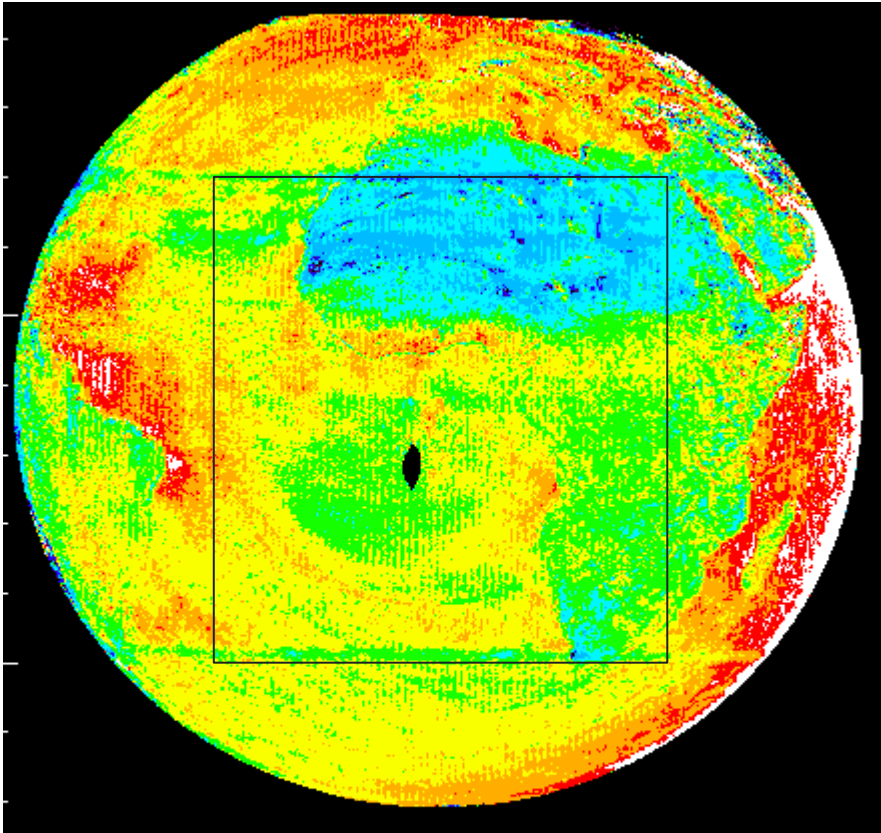


00:00 – 02:00 UTC central region

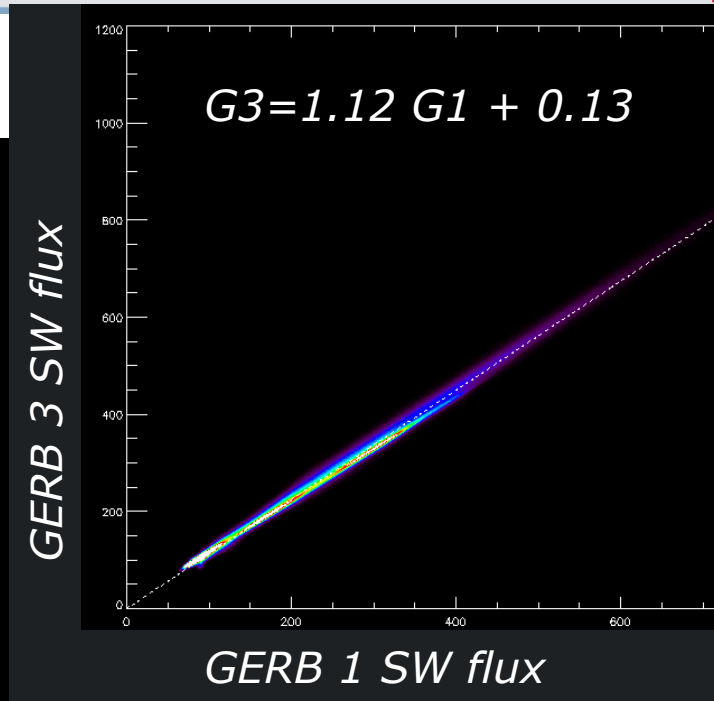


November 2012 11:00 – 13:00 UTC GERB 3/GERB 1 flux comparison

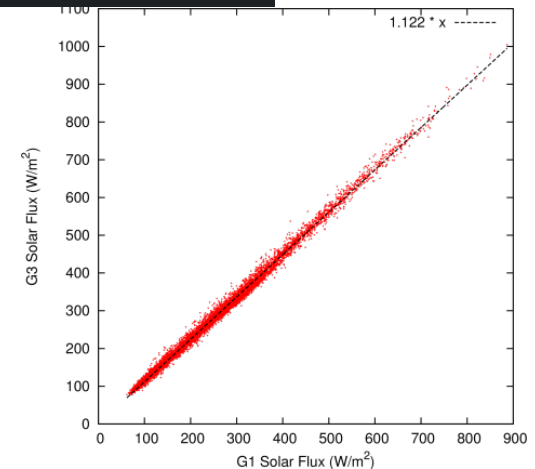
*Ratio of average fluxes for
November 2nd – 21st 11:00-13:00 UTC*



$\langle G3 \rangle / \langle G1 \rangle$ SW flux



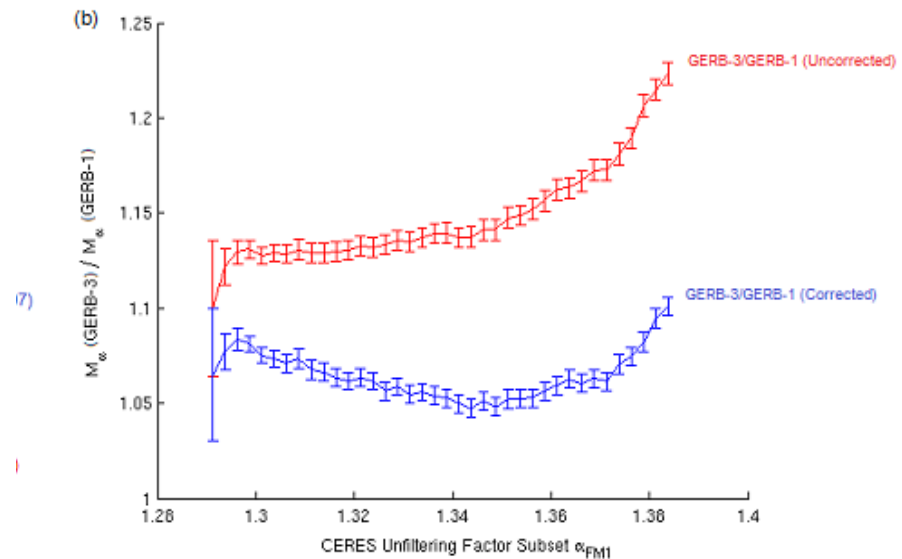
ARG Solar Flux - 201301151200



GERB 3 comparisons November 2012

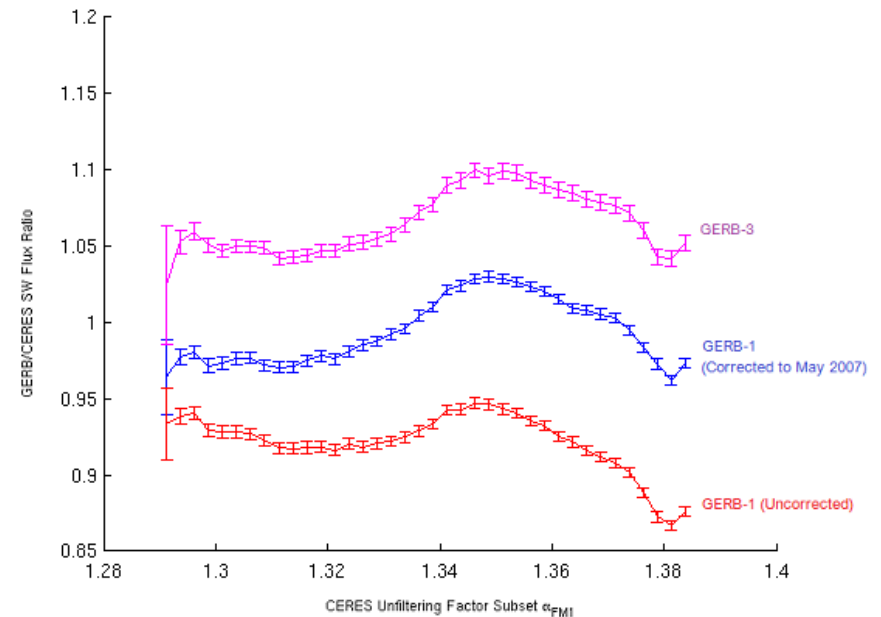
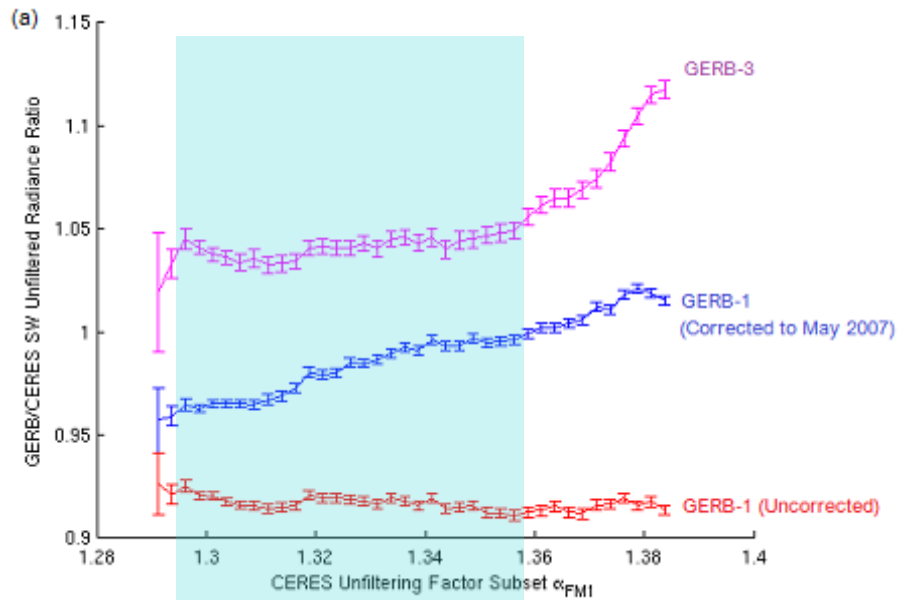
Initial comparison between the GERB 3 and GERB 1 fluxes for November 2012, showed very similar LW values, but GERB 3 12% higher in SW.

However GERB 1 has experienced spectral ageing over its operational life lifetime



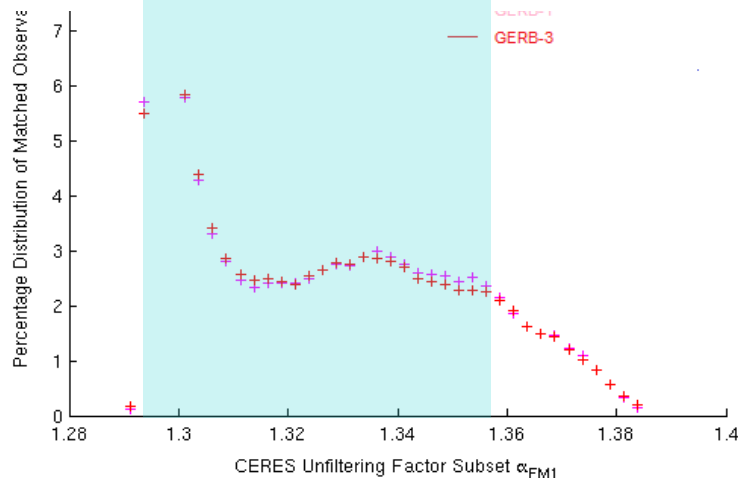
Adjusting for GERB 1 spectral ageing effect reduces the offset to 5-7%

GERB 3 comparisons November 2012

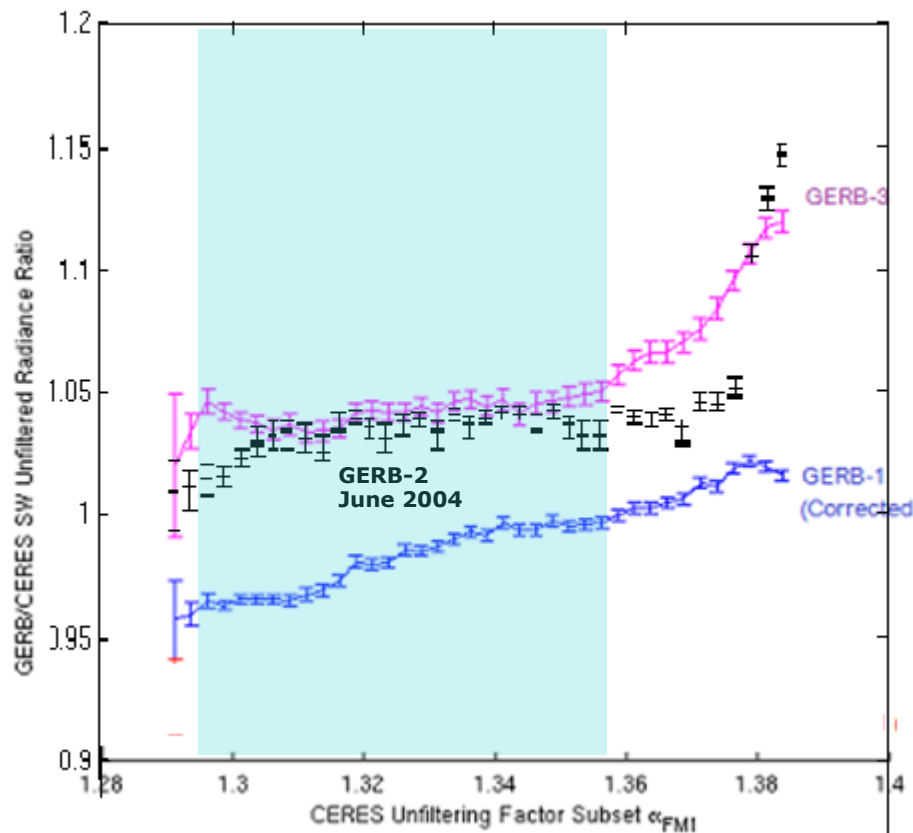


GERB 3/CERES radiance ratio for Nov 2012 is around 4% except for the bluest scenes (which have fewer matched points)

SEV 3 GERB-like RSW for this period around 3-4% higher than SEV 2 GERB-like RSW



GERB 3 comparisons November 2012



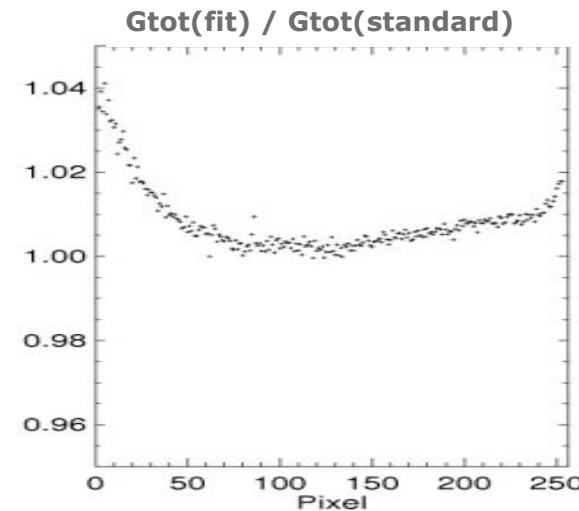
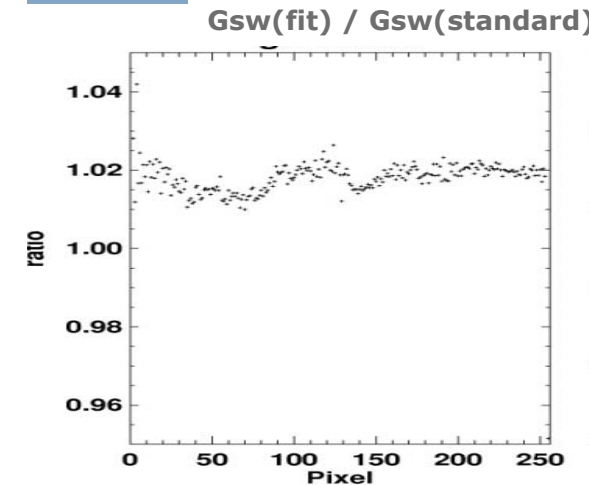
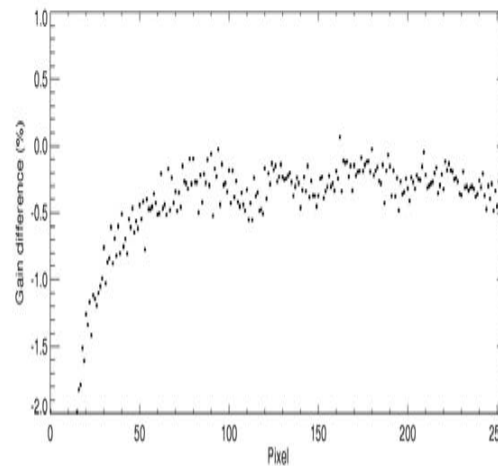
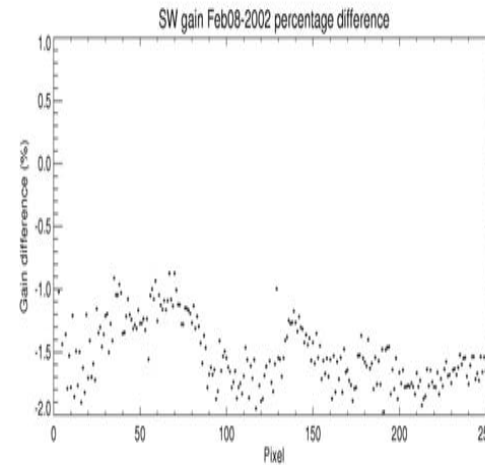
A similar comparison with GERB 2 during 2012 hasn't been carried out (because of the problem processing these data with the correction calibration for each mirror fact)

But comparing the GERB-2/ CERES ratio in June 2004 with the GERB-3/CERES ratio in November 20012 we see it is more similar than the GERB-1 / CERES ratio.

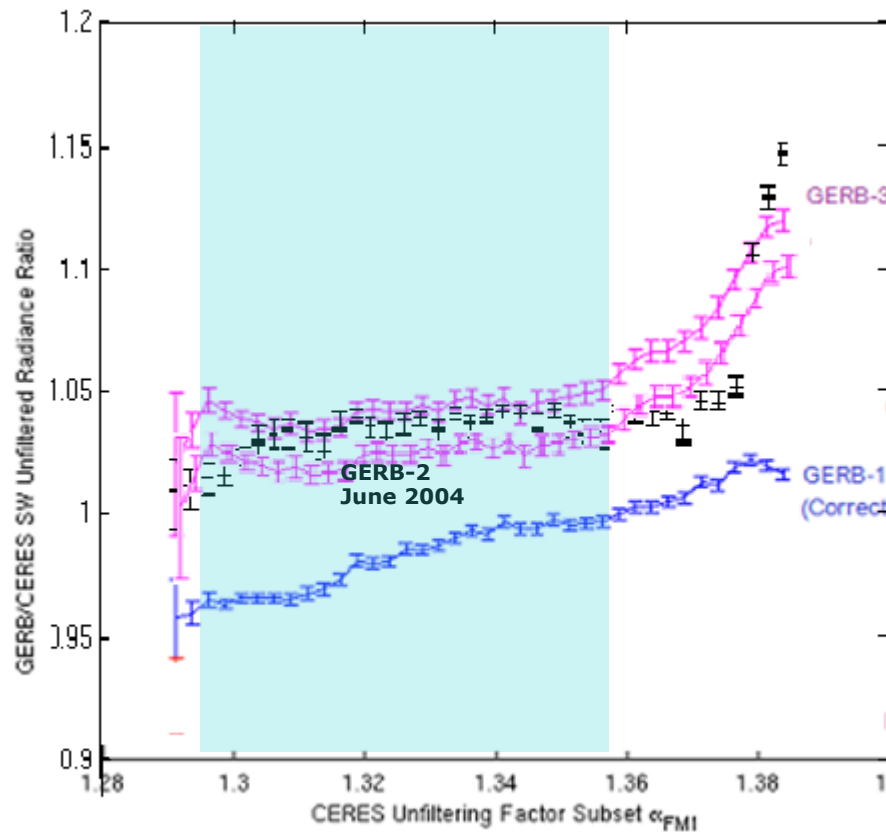
Ground gain offset effects

Difference between the GERB 3 recal delivered standard gains and the 2002 values seem to be very similar to the difference between standard and fit values. Seeming to implicate a problem with the offset removal being the cause of both differences.

There will be knock on effects on the applicability of the Lf(IBB) table



GERB 3 comparisons November 2012



A similar comparison with GERB 2 during 2012 hasn't been carried out (because of the problem processing these data with the correction calibration for each mirror fact)

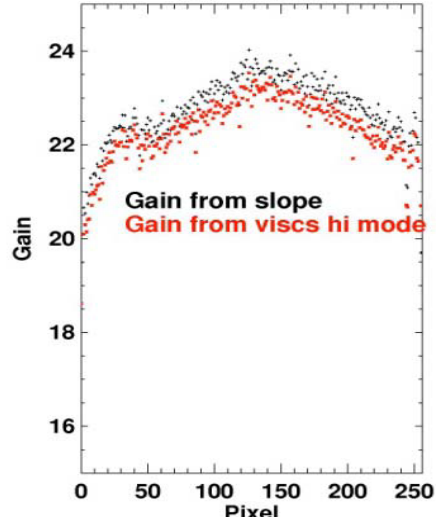
But comparing the GERB-2/ CERES ratio in June 2004 with the GERB-3/CERES ratio in November 20012 we see it is more similar than the GERB-1 / CERES ratio.

Summary

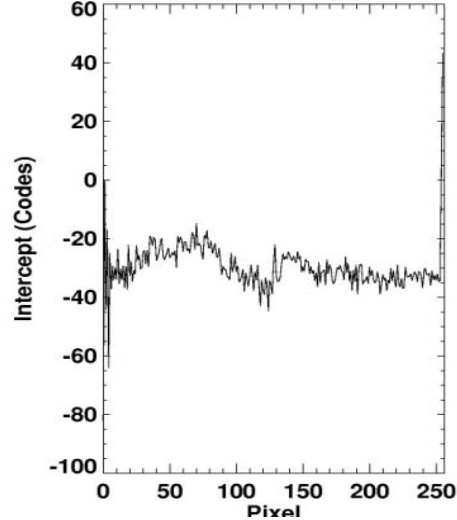
- GERB 3 LW 2012 compared well to GERB 1 LW (geolocation TOT/SW matching errors producing some more noise in day)
- GERB 3 SW 2012 12% higher than GERB 1
- After correction of GERB 1 SW to SOL value assuming FM1 stable reference difference reduces to 5-7%
- Removing offset issue with SW gain measurement in recal will reduce by 1.5-2% (varies with pixel) GERB 3 SW calibration
- GERB 3 SW closer to GERB 2 (SOL) calibration than GERB 1
- Next step to assess mirror side difference since stoppage.

Ground gain offset effects

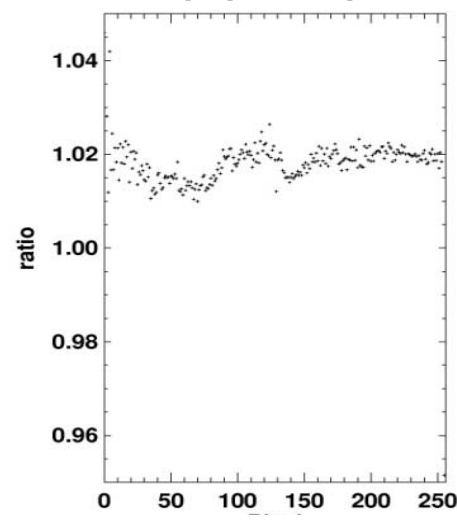
SW Gains



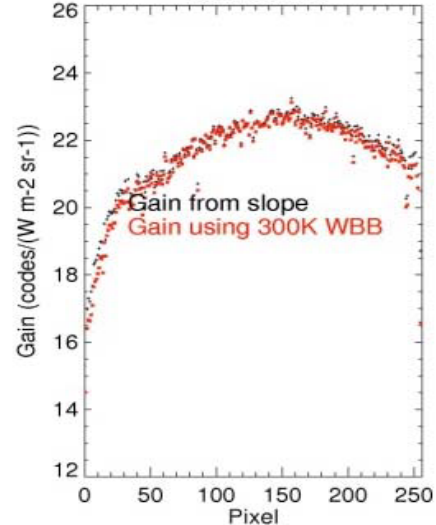
Fit intercept



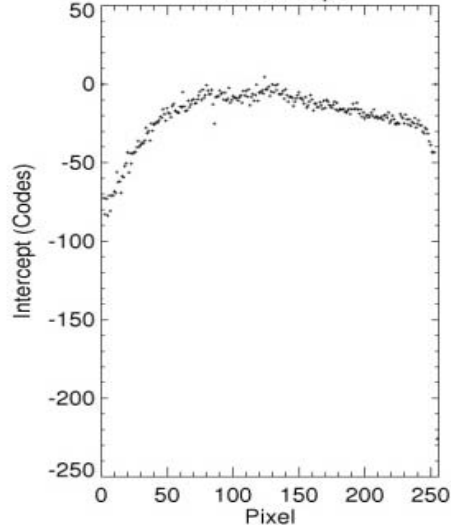
Gsw(fit) / Gsw(standard)



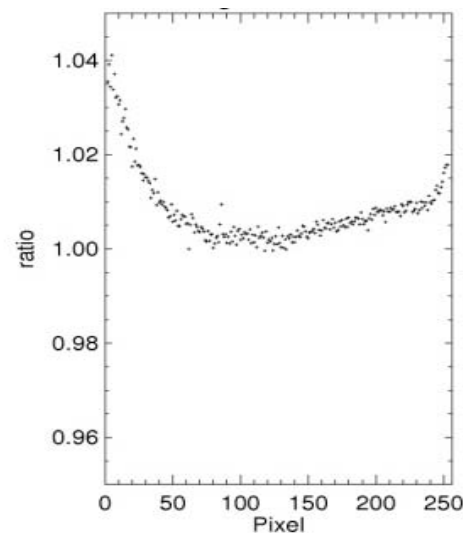
Total Gains



Fit intercept



Gtot(fit) / Gtot(standard)



*GERB 3 2008
calibration
difference between
gain calculated via
standard
procedure (offset
removed by
VISCSoff in SW and
BB in TOTAL),
and by fitting a
slope to the VISCS
high/low data or
WBB(t -20 to
+70 °C)*